

Application No. 10/765,797

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*AMENDMENTS TO THE CLAIMS*

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Previously Presented) A heat-sensitive lithographic printing plate precursor comprising a support having a hydrophilic surface and a coating provided on the hydrophilic surface, said coating comprising in the order given a first layer containing an oleophilic resin soluble in an aqueous alkaline developer and a second layer capable of preventing the developer from penetrating into the first layer at unexposed areas, said second layer comprising a water-repellent compound selected from the group consisting of

- a polymer comprising siloxane and/or perfluoroalkyl monomeric units, and
- a block- or graft-copolymer comprising a poly- or oligo(alkylene oxide) and a block of poly- or oligosiloxane and/or perfluoroalkyl units and

wherein the alkali-solubility of said coating increases on heating and said coating comprises an infrared light absorbing dye comprising at least one perfluoroalkyl group, wherein the infrared light absorbing dye carries a charge and at least one perfluoroalkyl group is included in a counter ion and contains at least 6 fluorine atoms.

2-3. (Canceled)

4. (Currently Amended) ~~A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein at least one perfluoroalkyl group is covalently linked to the infrared light absorbing dye and further comprises at least one perfluoroalkyl covalently bonded perfluoroalkyl group containing 6 more more fluorine atoms is included in a counter ion.~~

5. (Canceled)

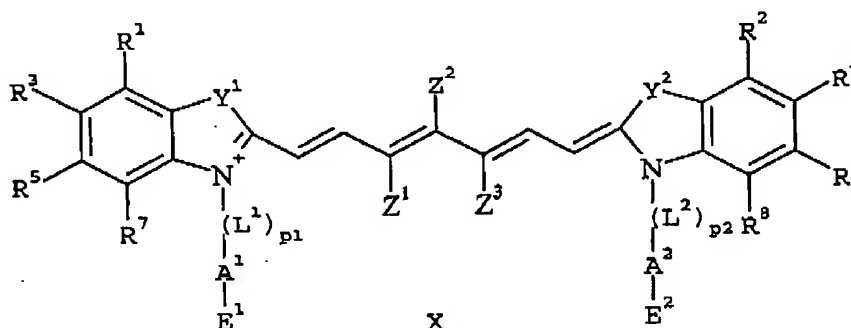
6. (Currently Amended) ~~A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m<sup>2</sup>.~~

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7. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

8. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to claim 1 wherein the infrared light absorbing dye corresponds to the following formula:



wherein

$-L^1-$  and  $-L^2-$  independently represent a divalent linking;

$-E^1$  and  $-E^2$  independently represent a neutral, anionic or cationic terminal group selected from

alkyl,  $-OH$ ,  $-H$ ,  $-Cl$ ,  $-Br$ ,  $-F$  (neutral groups);

$-SO_3^-$ ,  $-SO_4^-$ ,  $-PO_3^{2-}$ ,  $-PO_4^{2-}$ ,  $-COO^-$  (anionic groups);

$-[NR^aR^bR^c]^+$  (cationic group);

$R^a$ ,  $R^b$  and  $R^c$  independently represent a hydrogen atom or an alkyl group;

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$-A^1-$  and  $-A^2-$  independently represent  $-C_vF_{2v}-$ ,  $-[(CF_2)_2-O]_w-$ ,  
 a long chain alkyl alkylene group containing at least four carbon atoms, or an optionally  
 substituted alkyl, ~~alkenyl, aryl or aralkyl~~ alkylene, alkenylene, arylene or aralkylene group;

with  $p_1$  and  $p_2$  are 0 or 1;

with  $v$  and  $w$  are 2 or an integer greater than 2;

$-Y^1-$  and  $-Y^2-$  independently represent  $-CR^9R^{10}-$ ,  $-S-$ ,  $-Se-$ ,  $-NR^{11}-$ ,

$-CH=CH-$  or  $-O-$ ;

$R^1$  to  $R^{11}$  each independently represent a hydrogen atom, an optionally substituted alkyl,  
 alkenyl, aryl or aralkyl group or a group selected from a halogen atom,  ~~$NO_2$ ,  $NO_2$~~ ,  $-O-R^d$ ,  $-$   
 $CO-R^d$ ,  $-CO-O-R^d$ ,  $-O-CO-R^d$ ,  $-CO-NR^dR^e$ ,  $-NR^dR^e$ ,  $-NR^d-CO-R^e$ ,  $-NR^d-CO-O-R^e$ ,  $-NR^d-CO-$   
 $NR^eR^f$ ,  $-SR^d$ ,  $-SO-R^d$ ,  $-SO_2-R^d$ ,  $-SO_2-O-R^d$ ,  $-SO_2NR^dR^e$  or a perfluoroalkyl group, each of  
 said groups may optionally comprise a terminal group E defined above as  $-E^1$  and  $-E^2$  and/or  
 wherein two adjacent groups selected from  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $Y^1$  and  $Y^2$  together  
 form an optionally substituted 5- or 6- membered ring;

$R^d$ ,  $R^e$  and  $R^f$  independently represent a hydrogen or an optionally substituted alkyl, alkenyl,  
 aryl or aralkyl group;

$Z^1$  and  $Z^3$  each independently represent a hydrogen atom, an alkyl group or  $Z^1$  and  $Z^3$   
 together represent the necessary atoms to complete an optionally substituted 5- or 6-  
 membered ring;

$Z^2$  represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an  
 amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a  
 barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

X represents one or more ~~optional~~ counter ions having a total charge ~~opposite so as to make~~  
 the dye electrically neutral and wherein X optionally-comprises a perfluoroalkyl group  
 containing at least 6 fluorine atoms;

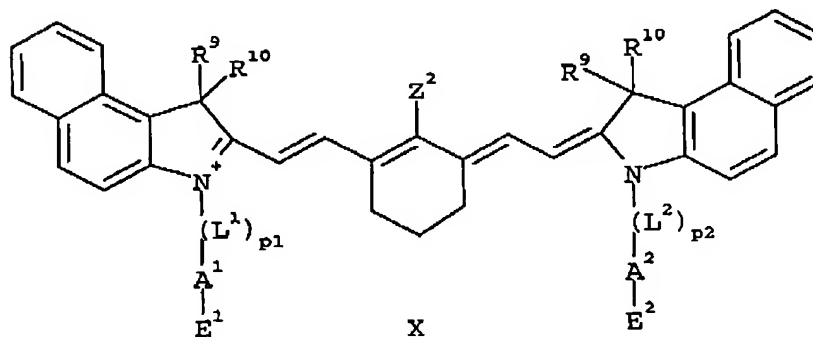
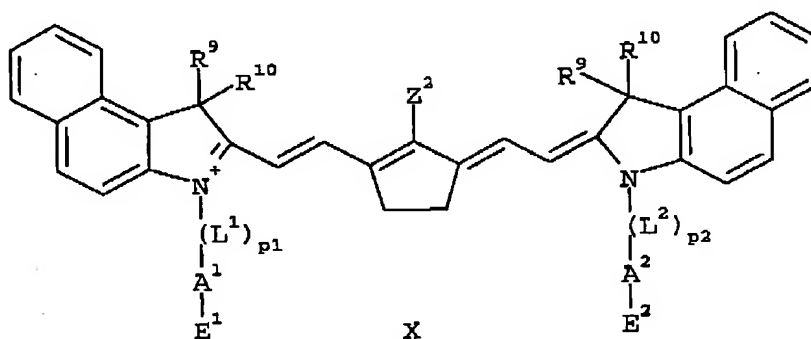
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with the proviso that at least one of the following substituents contains a perfluoroalkyl group:  $A^1$ ,  $A^2$ ,  $R^1$  to  $R^{14}$  or  $X$ .

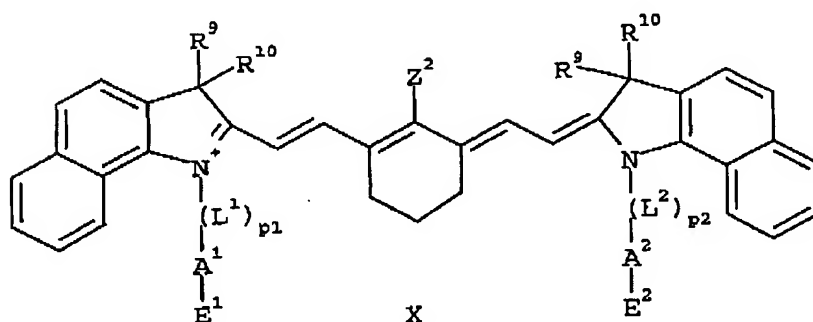
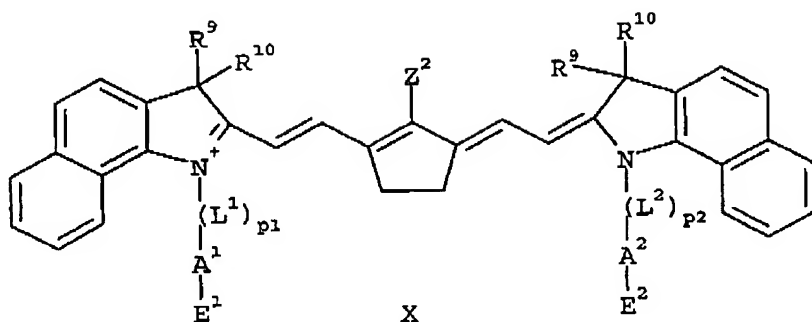
9. (Currently Amended) A ~~The heat-sensitive~~ lithographic printing plate precursor according to ~~claim 8~~ claim 37 wherein  $-Z^1$  and  $-Z^3$  together represent  $-(CH_2)_2-$  or  $-(CH_2)_3-$ .

10. (Currently Amended) A ~~The heat-sensitive~~ lithographic printing plate precursor according to ~~claim 8~~ claim 9 wherein the IR light absorbing dye corresponds to one of the following formulae:



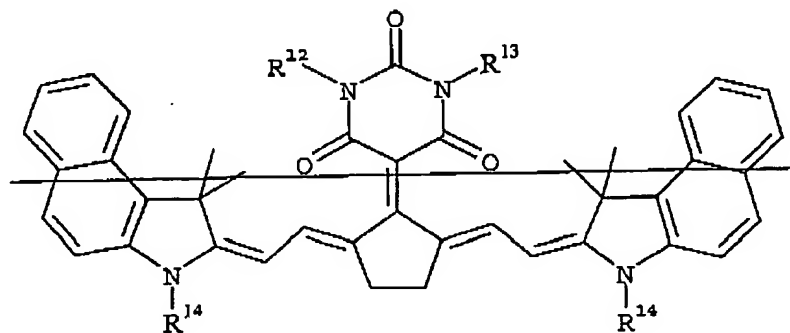
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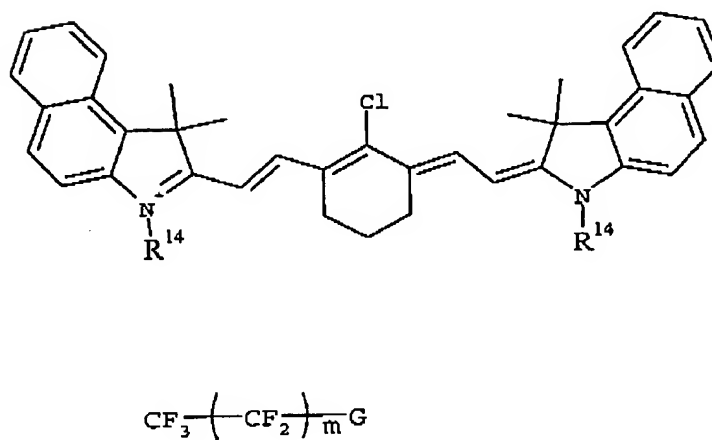
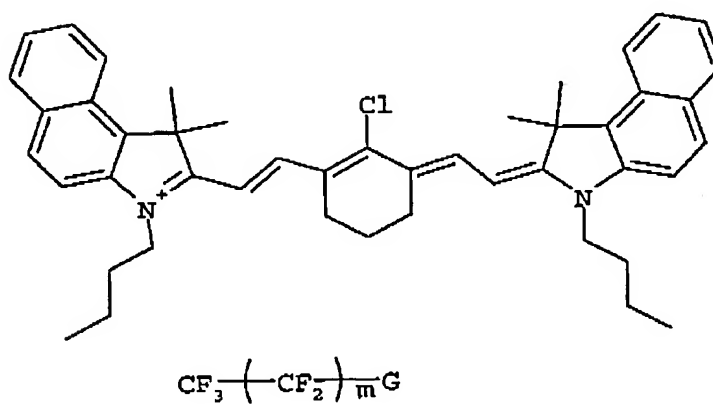
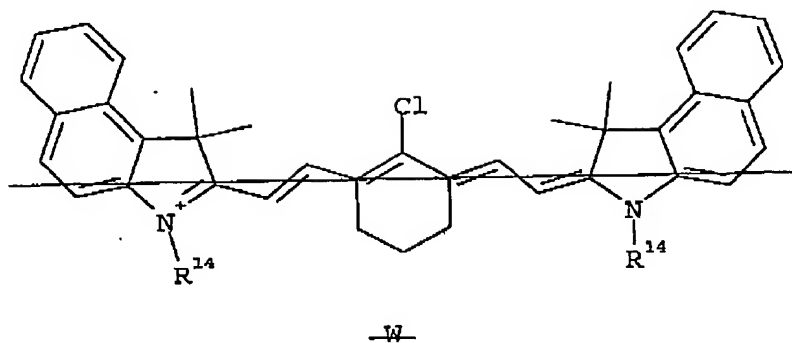
wherein  $p_1$ ,  $p_2$ ,  $L^1$ ,  $L^2$ ,  $A^1$ ,  $A^2$ ,  $E^1$ ,  $E^2$ ,  $R^9$ ,  $R^{10}$ ,  $Z^2$  and  $X$  have the same meaning as defined in claim 8.

11. (Currently Amended) A The heat-sensitive lithographic printing plate precursor according to ~~claim 8~~ claim 9 wherein the IR light absorbing dye corresponds to one of the following formulae:



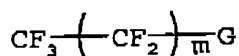
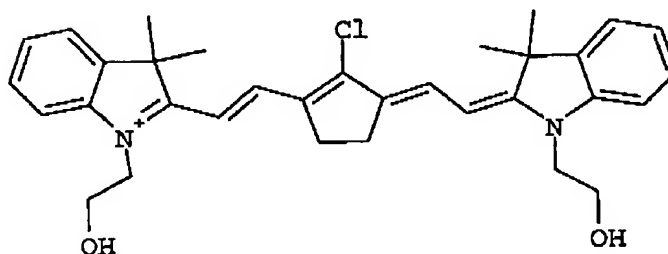
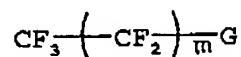
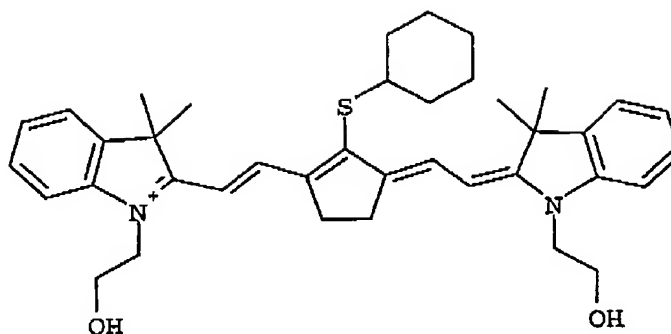
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wherein

m is 2 or an integer greater than 2;

~~R<sup>12</sup> and R<sup>13</sup> independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a perfluoroalkyl group which may optionally comprise a terminal group E defined as E<sup>1</sup> and E<sup>2</sup> in claim 8;~~

R<sup>14</sup> represents  $-(\text{CH}_2)_2-\text{OCO}-(\text{CH}_2)_2-(\text{CF}_2)_k-\text{CF}_3$ ;

with k is 2 or an integer greater than 2; and

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~~W~~ represents ~~Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, F<sup>-</sup>, ClO<sub>4</sub><sup>-</sup>, BF<sub>4</sub><sup>-</sup>~~;

G represents ~~SO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>-</sup>~~ SO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>-</sup> or COO<sup>-</sup>.

12-16. (Canceled)

17. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the amount of the water-repellent compound in the coating is between 0.5 and 15 mg/m<sup>2</sup>.

18-20. (Canceled)

21. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

22. (Canceled)

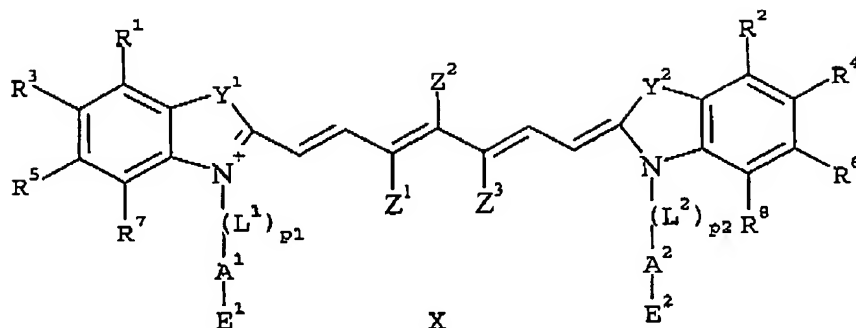
23. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 6 wherein the second layer consists essentially of the water-repellent compound and the infrared light absorbing dye.

24. (Currently Amended) ~~A~~ The heat sensitive lithographic printing plate precursor according to claim 4 wherein the infrared light absorbing dye corresponds to the following formula:



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wherein

$-L^1-$  and  $-L^2-$  independently represent a divalent linking;

$-E^1$  and  $-E^2$  independently represent a neutral, anionic or cationic terminal group selected from

alkyl,  $-OH$ ,  $-H$ ,  $-Cl$ ,  $-Br$ ,  $-F$  (neutral groups);

$-SO_3^-$ ,  $-SO_4^{2-}$ ,  $-PO_3^{2-}$ ,  $-PO_4^{2-}$ ,  $-COO^-$  (anionic groups);

$-[NR^aR^bR^c]^+$  (cationic group);

$R^a$ ,  $R^b$  and  $R^c$  independently represent a hydrogen atom or an alkyl group;

$-A^1-$  and  $-A^2-$  independently represent  $-C_vF_{2v}-$ ,  $-[(CF_2)_2O]_w-$ ,

a long chain ~~alkyl~~ alkylene group containing at least four carbon atoms, or an optionally substituted ~~alkyl~~, ~~alkenyl~~, ~~aryl~~ or ~~aralkyl~~ alkylene, alkenylene, arylene or aralkylene group;

with  $p_1$  and  $p_2$  are 0 or 1;

with  $v$  and  $w$  are 2 or an integer greater than 2;

$-Y^1-$  and  $-Y^2-$  independently represent  $-CR^9R^{10}-$ ,  $-S-$ ,  $-Se-$ ,  $-NR^{11}-$ ,

$-CH=CH-$  or  $-O-$ ;

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$R^1$  to  $R^{11}$  each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom,  $-\text{NO}_2$ ,  $-\text{NO}_2$ ,  $-\text{O}-R^d$ ,  $-\text{CO}-R^d$ ,  $-\text{CO}-\text{O}-R^d$ ,  $-\text{O}-\text{CO}-R^d$ ,  $-\text{CO}-\text{NR}^d\text{R}^e$ ,  $-\text{NR}^d\text{R}^e$ ,  $-\text{NR}^d-\text{CO}-R^e$ ,  $-\text{NR}^d-\text{CO}-\text{O}-R^e$ ,  $-\text{NR}^d-\text{CO}-\text{NR}^e\text{R}^f$ ,  $-\text{SR}^d$ ,  $-\text{SO}-R^d$ ,  $-\text{SO}_2-R^d$ ,  $-\text{SO}_2-\text{O}-R^d$ ,  $-\text{SO}_2\text{NR}^d\text{R}^e$  or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as  $-\text{E}^1$  and  $-\text{E}^2$  and/or wherein two adjacent groups selected from  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $Y^1$  and  $Y^2$  together form an optionally substituted 5- or 6- membered ring;  
 $R^d$ ,  $R^e$  and  $R^f$  independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

$Z^1$  and  $Z^3$  each independently represent a hydrogen atom, an alkyl group or  $Z^1$  and  $Z^3$  together represent the necessary atoms to complete an optionally substituted 5- or 6- membered ring;

$Z^2$  represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;

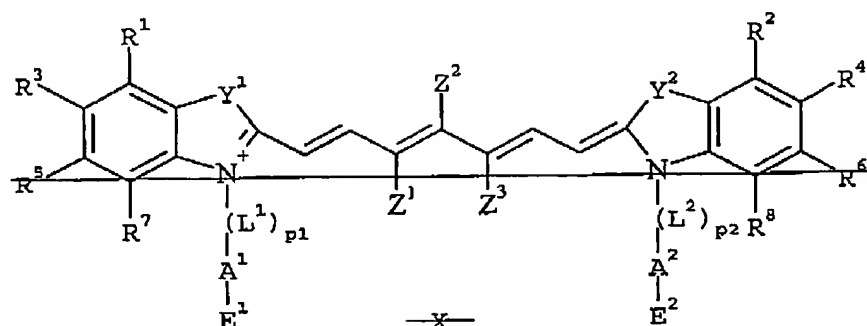
X represents one or more counter ions having a total charge opposite so as to make the dye electrically neutral and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms;

with the proviso that at least one of  $R^1$  to  $R^{11}$  contains a perfluoroalkyl group or at least one of  $-\text{A}^1-$  and  $-\text{A}^2-$  contains a  $-\text{C}_v\text{F}_{2v}-$  group or a  $-\text{[(CF}_2)_2-\text{O}]_w-$  group.

25. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 36 claim 24 wherein, ~~the infrared light absorbing dye corresponds to the following formula:~~

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wherein

$L^1$  and  $L^2$  independently represent a divalent linking;

$E^1$  and  $E^2$  independently represent a neutral, anionic or cationic terminal group selected from

alkyl, OH, H, Cl, Br, F (neutral groups);

$SO_3^-$ ,  $SO_4^-$ ,  $PO_3^{2-}$ ,  $PO_4^{2-}$ ,  $COO^-$  (anionic groups);

$[NR^aR^bR^c]^+$  (cationic group);

$R^a$ ,  $R^b$  and  $R^c$  independently represent a hydrogen atom or an alkyl group;

$A^1$  and  $A^2$  independently represent  $C_nF_{2n}$ ,  $[(CF_2)_2O]_w$ ,

a long chain alkyl group containing at least four carbon atoms, or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

with  $p_1$  and  $p_2$  are 0 or 1;

with  $v$  and  $w$  are 2 or an integer greater than 2;

$Y^1$  and  $Y^2$  independently represent  $CR^9R^{10}$ , S, Se,  $NR^{11}$ ,

$CH=CH$  or  $O$ ;

$R^1$  to  $R^{11}$  each independently represent a hydrogen atom, an optionally substituted alkyl,

alkenyl, aryl or aralkyl group or a group selected from a halogen atom,  $NO_2$ ,  $OR^d$ ,  $CO R^d$ ,

$CO OR^d$ ,

$OCO R^d$ ,  $CONR^dR^e$ ,  $NR^dR^e$ ,  $NR^dCO R^e$ ,  $NR^dCO OR^e$ ,  $NR^dCONR^eR^f$ ,  $SR^d$ ,  $SO$

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~~$R^d$ ,  $SO_2-R^d$ ,  $SO_2-O-R^d$ ,  $SO_2NR^dR^e$  or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as  $E^1$  and  $E^2$  and/or wherein two adjacent groups selected from  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $Y^1$  and  $Y^2$  together form an optionally substituted 5- or 6- membered ring;~~

~~$R^d$ ,  $R^e$  and  $R^f$  independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;~~

~~$Z^1$  and  $Z^3$  each independently represent a hydrogen atom, an alkyl group or  $Z^1$  and  $Z^3$  together represent the necessary atoms to complete an optionally substituted 5- or 6- membered ring;~~

~~$Z^2$  represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;~~

~~X represents one or more counter ions having a total charge opposite to the dye and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms;~~

~~with the proviso that at least one of the following substituents contains a perfluoroalkyl group:~~

~~$A^1$ ,  $A^2$ , or  $R^1$  to  $R^{11}$ .~~

26. (Canceled)

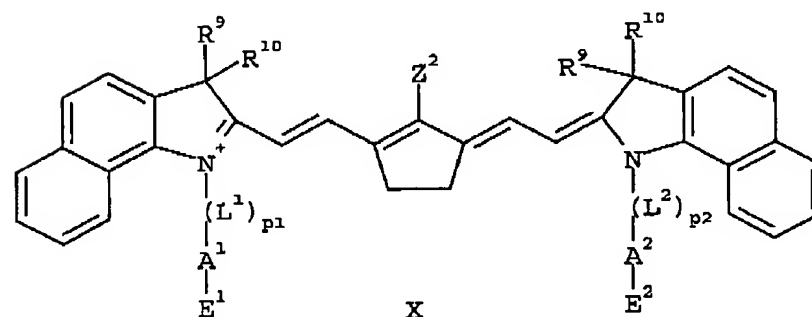
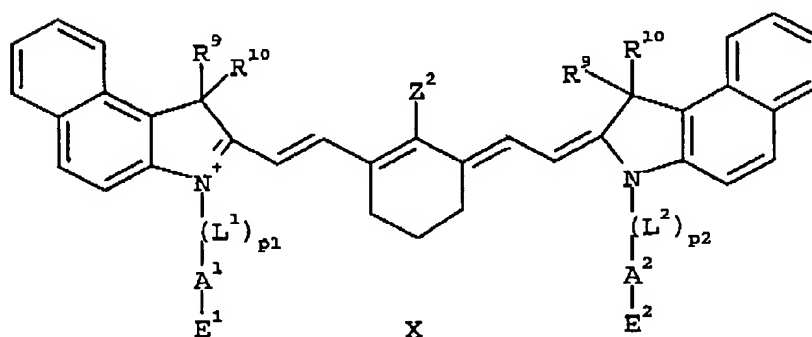
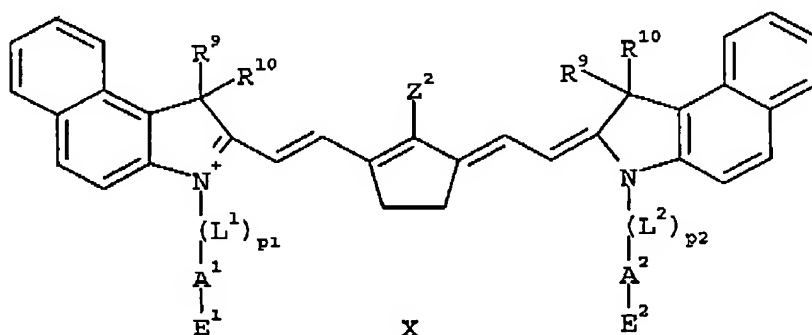
27. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 24 claim 25, wherein  $-Z^1$  and  $-Z^3$  together represent  $-(CH_2)_2-$  or  $-(CH_2)_3-$ .

28-29. (Canceled)

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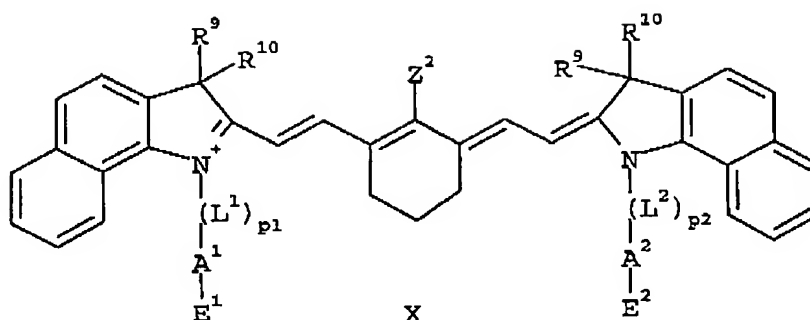
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30. (Currently Amended) A The heat sensitive lithographic printing plate precursor according to claim 27 wherein the IR light absorbing dye corresponds to one of the following formulae:



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wherein—

~~$L^1$  and  $L^2$  independently represent a divalent linking;~~

~~$E^1$  and  $E^2$  independently represent a neutral, anionic or cationic terminal group selected from~~

~~alkyl, OH, H, Cl, Br, F (neutral groups);~~

~~$\text{SO}_3^-$ ,  $\text{SO}_4^-$ ,  $\text{PO}_3^{2-}$ ,  $\text{PO}_4^{2-}$ ,  $\text{COO}^-$  (anionic groups);~~

~~$[\text{NR}^a\text{R}^b\text{R}^c]^+$  (cationic group);~~

~~$\text{R}^a$ ,  $\text{R}^b$  and  $\text{R}^c$  independently represent a hydrogen atom or an alkyl group;~~

~~$A^1$  and  $A^2$  independently represent  $\text{C}_v\text{F}_{2v}$ ,  $[(\text{CF}_2)_2\text{O}]_w$ ,~~

~~a long chain alkyl group containing at least four carbon atoms, or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;~~

~~with  $p_1$  and  $p_2$  are 0 or 1;~~

~~with  $v$  and  $w$  are 2 or an integer greater than 2;~~

$\text{R}^9$  and  $\text{R}^{10}$  each independently represent a hydrogen atom, an optionally substituted alkyl, alkenyl, aryl or aralkyl group or a group selected from a halogen atom,  $\text{NO}_2$ ,  $\text{NO}_2$ ,  $\text{O-R}^d$ ,  $\text{CO-R}^d$ ,  $\text{CO-O-R}^d$ ,  $\text{O-CO-R}^d$ ,  $\text{CO-NR}^d\text{R}^e$ ,  $\text{NR}^d\text{R}^e$ ,  $\text{NR}^d\text{CO-R}^e$ ,  $\text{NR}^d\text{CO-O-R}^e$ ,  $\text{NR}^d\text{CO-NR}^e\text{R}^f$ ,  $\text{SR}^d$ ,  $\text{SO-R}^d$ ,  $\text{SO}_2\text{R}^d$ ,  $\text{SO}_2\text{O-R}^d$ ,  $\text{SO}_2\text{NR}^d\text{R}^e$  or a perfluoroalkyl group, each of said groups may optionally comprise a terminal group E defined above as  $\text{E}^1$  and  $\text{E}^2$ ;  $\text{R}^d$ ,  $\text{R}^e$  and  $\text{R}^f$  independently represent a hydrogen or an optionally substituted alkyl, alkenyl, aryl or aralkyl group;

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~~Z<sup>2</sup> represents a substituent selected from a hydrogen atom, an alkyl group, a halogen atom, an amino group, an arylthio group, an alkylthio group, an aryloxy group, an alkoxy group, a barbituric group or a thiobarbituric group, each of said groups being optionally substituted;~~

~~X represents one or more counter ions having a total charge opposite to the dye and wherein X comprises a perfluoroalkyl group containing at least 6 fluorine atoms.~~

31-36. (Canceled)

37. (New) The heat-sensitive lithographic printing plate precursor according to claim 8 wherein -Z<sup>1</sup> and -Z<sup>3</sup> together represent the necessary atoms to complete an optionally substituted 5- or 6-membered ring.